

REMARKS/ARGUMENTS

Applicants acknowledge receipt of the Office Action dated September 16, 2005 (hereinafter *Office Action*). In that Action, the Examiner (1) rejected claims 1-14 under 35 U.S.C. § 103(a) as being unpatentable over *Orban* et al. (U.S. Patent 5,448,227) (hereinafter *Orban*), in view of *Goodson Jr.* et al. (U.S. Patent 6,568,470) (hereinafter *Goodson*); and (2) allowed claims 15-24. In response to the Examiner's rejections, the Applicants amend the claims and present the following response:

Rejection for Obviousness under 35 U.S.C. § 103(a)

The Examiner rejected claims 1-14 under 35 U.S.C. § 103(a) as being unpatentable over *Orban* in view of *Goodson*. Applicants respectfully traverse the Examiner's rejections of claims 1-14 as being unpatentable over *Orban* in view of *Goodson*.

In order to establish a *prima facie* case of obviousness, the Examiner must meet the following three elements: 1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the teachings; 2) there must be a reasonable expectation of success; and 3) the prior art reference(s) must teach or suggest all the claim limitations. *MPEP* § 2143 (2000) (citing *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991)). Applicants submit that the Examiner has failed to make a *prima facie* case of obviousness in rejecting claims 1-14.

A showing of reasonable expectation of success is one element necessary to establish a *prima facie* case of obviousness. In rejecting claims 1 and 7, the Examiner relies on *Orban* to teach all the limitations of claims 1 and 7 except for the electroactive fluid. The Examiner relies on *Goodson* to teach the "electro-active fluid." The Examiner then states that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the electro-active fluid of *Goodson* into the system of *Orban*." Incorporating the electroactive fluid of *Goodson* into the system of *Orban* would require the replacement of the drilling mud of *Orban* with the electroactive fluid of *Goodson*. One skilled in the art will understand that there is no reasonable expectation of success in replacing the drilling mud of *Orban* with the electroactive fluid of *Goodson*. Drilling mud and electroactive fluids have different physical properties and are intended for different uses. Drilling mud is pumped down the inside of a drill string, leaves the drill string through the drill bit, and flows back to the surface via the annulus between the outside of the drill string and the inside of the

wellbore. Drilling mud is designed for numerous uses including lubrication of the drill bit, controlling wellbore pressure, moving drill cuttings away from the drill bit and out of the wellbore, communicating with the surface via pressure pulses, powering downhole drilling motors, etc. However, electroactive fluids are designed as controllable fluids whose viscosity or resistance to flow is altered by magnetic or electric fields. Since electroactive fluids have different physical properties than drilling mud, and because electroactive fluids are not designed to satisfy the purposes of drilling mud, electroactive fluids may not function effectively in place of drilling mud. Thus, one skilled in the art will understand that there is no reasonable expectation of success in replacing the drilling mud of *Orban* with the electroactive fluid of *Goodson*.

Further, electroactive fluids are created from particular constituents combined in controlled proportions. The proper functioning of the electroactive fluid requires maintenance of the composition of the electroactive fluid within certain limits. For example, *Goodson* teaches that electroactive fluids (MR and ER fluids) are non-colloidal suspensions of polarizable particles having a size on the order of a few microns. See Col. 1, Lines 56-58; Col. 2, Lines 1-3. Carrier fluids for the magnetically responsive particles include hydrocarbon oil, silicon oil, and water. See Col. 1, Lines 56-59. Further, the particulates in the carrier fluid may represent 25-45% of the total mixture volume. See Col. 1, Lines 59-61. If the drilling mud of *Orban* is replaced with the electroactive fluid of *Goodson*, the electroactive fluid will not be isolated from, and therefore may become contaminated with drill cuttings of various sizes, hydrocarbon formation fluids, hydrocarbon formation gases, etc. Such contamination will alter the physical composition and makeup of the electroactive fluid, which may detrimentally impact the effectiveness and useful life of the electroactive fluid. Thus, one skilled in the art will understand that there is no reasonable expectation of success in replacing the drilling mud of *Orban* with the electroactive fluid of *Goodson*.

Another element required to establish a *prima facie* case of obviousness is that the prior art references must teach or suggest all the claim limitations. Claim 1 has been amended to more distinctly claim "a second body coupled to said first body and at least partially disposed within an electroactive fluid, wherein said electroactive fluid is isolated from said flowing fluid." Claims 2-6 depend from independent claim 1. Similarly, claim 7 has been amended to more distinctly claim a step of "coupling the first body to a second body disposed in an electroactive fluid, wherein said electroactive fluid is isolated from said flowing fluid." Claims 8-14 depend from independent claim 7. The cited art does not teach or suggest these limitations. As noted by the Examiner, *Orban* does not disclose an electroactive fluid. See *Office Action*, Page 3. Therefore, *Orban* also does not

disclose a second body coupled to the first body and at least partially disposed within an electroactive fluid, wherein the electroactive fluid is isolated from the flowing fluid. These missing limitations cannot be supplied by *Goodson*. In *Goodson*, the change in viscosity of an electroactive fluid subjected to electromagnetic fields is utilized to alter the force acting on the face of a piston or to temporarily block the flow bore of a tube. See Col. 2, Lines 27-62. *Goodson* does not disclose a second body coupled to the first body and at least partially disposed within an electroactive fluid, wherein the electroactive fluid is isolated from the flowing fluid.

Yet another element required to establish a *prima facie* case of obviousness is that there must be some suggestion or motivation to combine or modify the references. According to the *Manual of Patent Examining Procedure*, "[t]he mere fact that references *can* be combined or modified does not render the resultant combination obvious *unless* the prior art also suggests the desirability of the combination." *MPEP* § 2143.01 (2000). *Orban* discloses a measuring-while-drilling (MWD) system for use in making downhole measurements during the drilling of a borehole. See Col. 4, Lines 50-53. The WMD system includes a sensor sub (22) positioned at the lower end of a downhole motor assembly. See Col. 4, Lines 57-60; Col. 6, Lines 64-68; Figure 1. The sensor sub houses instrumentalities that measure various downhole parameters. See Col. 4, Lines 60-64. Sonic or electromagnetic telemetry signals representing these measurements are relayed to a MWD tool (17). See Col. 5, Lines 5-10; Figure 1. The MWD tool (17) transmits this information to the surface through mud pulses produced by passing the drilling mud through a valve that repeatedly interrupts the flow of drilling mud pumped down the drill string. See Col. 5, Lines 15-20; Col. 8, Lines 2-8. There is nothing in *Orban* to suggest combining the WMD system of *Orban* and the electroactive fluid actuated downhole tools of *Goodson* to teach "a pressure pulser" or a method "for generating a pressure pulse."

Goodson discloses downhole tools that are actuated by an electroactive fluid within the tool that becomes either highly viscous or a solid when subjected to a magnetic field. See Col. 2, Lines 23-27. The change in viscosity of the electroactive fluid alters the force acting on a face of a piston or temporarily blocks the flow bore of a tube. See Col. 2, Lines 27-62. There is nothing in *Goodson* to suggest combining the WMD system of *Orban* and the electroactive fluid actuated downhole tools of *Goodson* to teach "a pressure pulser" or a method "for generating a pressure pulse."

Therefore, for at least the reasons discussed above, Applicants respectfully submit that claims 1 and 7 are not obvious based on a combination of *Orban* and *Goodson*. Since independent claims 1

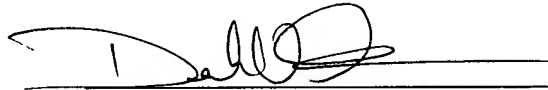
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and 7 are submitted to be allowable, dependent claims 2-6 and 8-14, respectively, must *a fortiori* also be allowable, since they carry with them all the limitations of such independent claims.

Conclusion

This is believed to be a full and complete response to the Office Action. Applicants believe that all claims are free of the prior art and are in condition for allowance. Allowance of all pending claims is respectfully requested. If the Examiner believes that a telephonic interview would be beneficial, please contact the undersigned at the telephone number listed below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Derek Forinash', is written over a horizontal line.

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